

### Remarks

Claims 164, 166, 170-174 and 196-229 are pending in the Application.

Claims 164, 166, 170-174 and 196-229 are rejected.

#### I. REJECTIONS UNDER 35 U.S.C. § 102/ § 103 OVER KIANG

Examiner has rejected Claims 164, 166, 170-174 and 199-220 under 35 U.S.C. § 102(a) and (b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over Kiang *et al.* "Structural Modification of Single-Layer Carbon Nanotubes with an Electron Beam," *J. Phys. Chem.* **1996**, 100, 3749-3752, ("Kiang"). Final Office Action, at 2.

Examiner contends that the "reference teaches on pg. 3750 cut nanotubes. SWNTs are depicted, however, the discussion is general. In so far as claim 173, 174 require anything beyond nanotubes, then using SWNTs in a battery/fuel cell is an obvious expedient to exploit their electrical properties" *Id.*

Applicant respectfully traverses the rejection.

Regarding rejections under 35 U.S.C. § 102(a) and (b), anticipation requires each and every element of the claim to be found within the cited prior art reference. Regarding rejections under 35 U.S.C. § 103(a), in its recent opinion in *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007), the Supreme Court noted the obviousness analysis under § 103 should be explicit, and that it was "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. *KSR Int'l*, 127 S. Ct. at 1131. Moreover, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. See M.P.E.P. 706.02(j); see also *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Failing any of the above, a *prima facie* case of obviousness is not established. *Id.*

*Regarding Claims 164 and 166*, *Kiang* does not teach, disclose or suggest a quantum device comprising a plurality of conductors or an integrated circuit comprising a plurality of molecular wires, respectively, each of which requires cut single-wall carbon nanotubes integrated into conductors of the quantum device or into the molecular wires of the integrated circuit. Furthermore, each of these claims also requires that the cut single-wall carbon nanotubes have a substantially similar length. There is no teaching or suggestion in *Kiang* that the cut single-wall carbon nanotubes of *Kiang* have a substantially similar length. To the contrary, *Kiang* discloses cutting nanotubes with no suggestion or motivation to cut them so that their resulting lengths would be substantially similar.

Furthermore, regarding Claim 164, this claim is drawn to a quantum device. *Kiang* does not teach, disclose or suggest a quantum device, nor does *Kiang* teach, disclose or suggest "a quantum device comprising a plurality of conductors, wherein the conductors of the quantum device comprise cut single-wall carbon nanotubes, wherein the cut single-wall carbon nanotubes of the conductors have a substantially similar length," as required by Claim 164. Thus, *Kiang* does not teach or suggest all the limitations of the claims. Furthermore, there is no suggestion or motivation in *Kiang* or in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at these claims of the instant invention. Thus, Claim 164 is neither anticipated nor *prima facie* obvious over *Kiang*.

*Regarding Claim 199*, this claim is dependent upon Claim 164 and further requires, *inter alia*, that the cut single-wall carbon nanotubes have a substantially similar length and diameter, and that "the substantially similar length is between the substantially similar diameter and 1000 times the substantially similar diameter." In addition to the requirements of Claim 164, *Kiang* also does not teach or suggest all the limitations of Claim 199. Furthermore, there is no suggestion or motivation in *Kiang* or in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at these claims of the instant invention. Thus, Claim 199 is neither anticipated nor *prima facie* obvious over *Kiang*.

*Regarding Claims 200-202*, these claims also depend from Claim 164 and further require that the cut single-wall carbon nanotubes have a substantially similar length in a

particular range. In addition to the requirements of Claim 164, *Kiang* also does not teach or suggest all the limitations of Claims 200-202. Furthermore, there is no suggestion or motivation in *Kiang* or in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at these claims of the instant invention. Thus, Claims 200-202 are neither anticipated nor *prima facie* obvious over *Kiang*.

Furthermore, regarding Claim 166, this claim drawn to an integrated circuit. *Kiang* does not teach or suggest an integrated circuit, nor does *Kiang* teach or suggest an "integrated circuit comprising a plurality of molecular wires, wherein the molecular wires of the integrated circuit comprise cut single-wall carbon nanotubes, wherein the cut single-wall carbon nanotubes have a substantially similar length," as required by Claim 166. Thus, *Kiang* does not teach or suggest all the limitations of the claims. Furthermore, there is no suggestion or motivation in *Kiang* or in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at these claims of the instant invention. Thus, Claim 166 is neither anticipated nor *prima facie* obvious over *Kiang*.

**Regarding Claims 203-205**, these claims also depend from Claim 166 and further require that the cut single-wall carbon nanotubes have a substantially similar length in a particular range. In addition to the requirements of Claim 166, *Kiang* also does not teach or suggest all the limitations of Claims 203-205. Furthermore, there is no suggestion or motivation in *Kiang* or in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at these claims of the instant invention. Thus, Claims 203-205 are neither anticipated nor *prima facie* obvious over *Kiang*.

**Regarding Claims 170-174**, *Kiang* does not teach or suggest an RF shielding device, a microwave absorbing material, a hydrogen storage device, a battery or a fuel cell, respectively, to which these claims are drawn. Nor does *Kiang* teach or suggest that the "purified and cut single-wall carbon nanotubes have a substantially similar length." Therefore, *Kiang* does not teach or suggest all the limitations of the claims. Applicant also notes that *Kiang* provides no teaching, disclosure, or even a suggestion that the cut single-wall carbon nanotubes have a substantially similar length. Furthermore, there is no suggestion or motivation in *Kiang* or in the knowledge

generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at the elements of these claims of the instant invention. Thus, Claims 170-174 are neither anticipated nor *prima facie* obviousness over *Kiang*.

As noted above in the Final Office Action, Examiner has contended "[i]n so far as claims 173, 174 require anything beyond nanotubes, then using SWNTs in a battery/fuel cell is an obvious expedient to exploit their electrical properties." Final Office Action, at 2. Applicant again reiterates that all of the claims (including, but not limited to Claims 173 and 174) require more than just cut single-wall carbon nanotubes, which Applicant has pointed out consistently during the prosecution of this Application. As for Claims 173 and 174, these claims do require additional features, including that the cut single-wall carbon nanotubes are included in a battery (Claim 173) and a fuel cell (Claim 174), and that the cut single-wall carbon nanotubes have a substantially similar length. As *Kiang* does not teach, disclose, or suggest such limitations (of a battery or a fuel cell), no *prima facie* case of obviousness has been made.

Applicant respectfully notes that a *prima facie* case of obviousness can only be made when the prior art reference (here *Kiang*) teaches or suggests all the claim limitations. See M.P.E.P. 706.02(j).

*Regarding Claims 206-208, Claims 209-211, Claims 212-214, Claims 215-217, and Claims 218-220*, these claims (as grouped above) depend from Claims 170, 171, 172, 173, and 174, respectively, and each of these claims further require that the cut single-wall carbon nanotubes have a substantially similar length in a particular range. In addition to the respective requirements set forth in each of these claims relevant to the independent claim from which it depends, *Kiang* also does not teach or suggest all the limitations of Claims 206-220. Furthermore, there is no suggestion or motivation in *Kiang* or in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at these claims of the instant invention. Thus, Claims 206-220 are neither anticipated nor *prima facie* obvious over *Kiang*.

Therefore, in view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejection of Claims 164, 166, 170-174 and 199-220 under 35 U.S.C. § 102(a) and

(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over *Kiang*.

## **II. REJECTIONS UNDER 35 U.S.C. §103(a) OVER KIANG**

Examiner has rejected Claims 170-174, 196-198 and 206-229 under 35 U.S.C. § 103(a) as being unpatentable over *Kiang et al.* Final Office Action, at 2.

Examiner contends that the "reference, *supra*, does not teach a battery/fuel cell/device, however using the nanotubes in these devices is an obvious expedient to exploit their well-characterized properties alluded to in col. 1. " *Id.*

Applicant respectfully traverses the rejection.

*Regarding Claims 170-174, 196-198 and 206-229*, these claims require, *inter alia*, that "the purified and cut single-wall carbon nanotubes have a substantially similar length."

Further regarding Claim 170 drawn to an RF shielding device, Claim 171 drawn to a microwave absorbing material, Claims 172 and 196 drawn to a hydrogen storage device, Claims 173 and 197 drawn to a battery, and Claims 174 and 198, drawn to a fuel cell, *Kiang* does not teach or suggest an RF shielding device, a microwave absorbing material, a hydrogen storage device, a battery or a fuel cell, to which these claims are drawn. Nor does *Kiang* teach or suggest that the "purified and cut single-wall carbon nanotubes have a substantially similar length," which is also required of these claims. Therefore, *Kiang* does not teach or suggest all the limitations of the claims. *Kiang* provides no teaching, disclosure, or even a suggestion that the purified and cut single-wall carbon nanotubes have a substantially similar length. Furthermore, there is no suggestion or motivation in *Kiang* or in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at the elements of these claims of the instant invention. Thus, Claims 170-174 and 196-198 are not *prima facie* obviousness over *Kiang*.

*Regarding Claims 206-208*, which depend from Claim 170, *Claims 209-211*, which depend from Claim 171, *Claims 212-214*, which depend from Claim 172, *Claims 215-217*, which

depend from Claim 173, *Claims 218-220*, which depend from Claim 174, *Claims 221-223*, which depend from Claim 196, *Claims 224-226*, which depend from Claim 197, and *Claims 227-229*, which depend from Claim 198, each of these claims require not only that the cut and purified single-wall carbon nanotubes have a substantially similar length, but also define particular length of the substantially similar length in the claims. Not only does *Kiang* not teach, disclose or suggest cut single-wall carbon nanotubes having a substantially similar length, but *Kiang* also does not teach, disclose or suggest particular substantially similar length, as required by dependent claims 206-229. As there is no suggestion or motivation in *Kiang* or in the knowledge generally available to one of ordinary skill in the art, to modify *Kiang* in order to arrive at the elements of these claims of the instant invention. Thus, Claims 206-229, which depend from Claims 170-174 and 196-198, are not *prima facie* obviousness over *Kiang*.

Therefore, in view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejection of Claims 170-174, 196-198 and 206-229 under 35 U.S.C. § 103(a) as obvious over *Kiang*.

### **III. REPLY TO EXAMINER'S ADDITIONAL REMARKS IN FINAL OFFICE ACTION**

The Examiner also contends that "*Kiang* teaches a homogeneous product." Final Office Action, at 2. Applicant respectfully disagrees. There is no teaching or suggestion in *Kiang* that the cut single-wall carbon nanotubes of *Kiang* have a substantial similar length. To the contrary, *Kiang* discloses cutting nanotubes with no suggestion or motivation to cut them so that the lengths would be a substantially similar length.

### **IV. CONCLUSION**

As a result of the foregoing, it is asserted by Applicant that the Claims in the Application are now in a condition for allowance, and respectfully requests allowance of such Claims.

Applicant believes that it has concurrently herewith paid all fees required with this amendment and that no further fees are due. However, should any further fees be required, the

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Commissioner is authorized to charge such fees to Deposit Account No. 06-1050. Please reference Attorney Docket No. 21753-0012014.

Applicant respectfully requests that the Examiner call Applicant's attorney at number listed below if the Examiner believes that such a discussion would be helpful in resolving any remaining problems.

Respectfully submitted,

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